UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
CHEMICAL SAFETY AND
POLLUTION PREVENTION

MEMORANDUM:

To: Helen Hull-Sanders, Ph.D., Risk Manager

From: Matthew Aubuchon, Ph.D., Entomologist

Secondary Review: Jennifer Saunders, Ph.D., Senior Biologist/Entomologist

Date: 8/21/2019

Subject: PRODUCT PERFORMANCE DATA EVALUATION RECORD (DER)

THIS DER NOT CONTAIN CONFIDENTIAL BUSINESS INFORMATION

Note: MRIDs found to be **unacceptable** to support label claims should be removed from the data matrix.

DP barcode: 451271
Decision no.: 548362
Submission no: 1030927
Action code: R310
Product Name: F9114 EC Turf Insecticide
EPA Reg. No or File Symbol: 279-OAUR
Formulation Type: Liquid emulsifiable concentrate
Ingredients statement from the label with PC codes included:
a.i.: Zeta-Cypermethrin (9.15%) PC: 129064

Application rate(s) of product and each active ingredient (lbs. or gallons/1000 square feet or per acre as appropriate; and g/m^2 or mg/cm^2 or mg/kg body weight as appropriate): Apply at rate of 0.05 – 0.55 fl oz / 1000ft^2 (0.014 – 0.15 lb ai/A).

Use Patterns: Outdoor broadcast applications, drench, or spot applications on listed insects in turf, golf courses, parks, landscaped areas around commercial and residential areas.

I. Action Requested: Registrant submitted new data (MRID 45773901) under an R310 PRIA action to support efficacy claims for a new product against fire ants. Registrant also cites reviewed data (MRIDs 47385708, 47385709, 47399101) to support efficacy claims.

II. Background: Registrant wants to register new product with efficacy claims against public health organisms.

III. MRID Summary: Registrant submitted MRID 45773901 and cited MRIDs 47385708, 47385709, and 47399101 to support product efficacy against fire ants. There are no roach or termite claims on the product label for 279-OAUR.

MRID 45773901: Efficacy of F701D and Mustang 1.5 EW for control of Cockroaches, Termite, and Fire Ants.

(1) non-GLP

(2) Methods: Efficacy data collected on Mustang 1.5 (EW: 17.1% zeta-cypermethrin) were submitted to support claims of 279-OAUR (EC: 9.15% zeta-cypermethrin) against fire ants. Because there are no claims against termites and roaches, review of those data do not apply to product 279-OAUR. Corresponding data on test product F2701D were not reviewed in this report because F2701D is a dust formulation that is co-formulated with PBO.

The spray solutions for direct applications and residual applications were prepared by diluting the required quantity of Mustang 1.5 EW with water. All aqueous solutions were applied using an automatic spray booth. All aqueous solutions were applied using an automatic spray booth. The sprayer was calibrated to deliver 72 ml of water to the treatment area as described in the Automatic Spray Booth SOP.

Direct applications were made to the following insects: *B. germanica* (German cockroach), *P. americana* (American cockroach), *S. invicta* (fire ant), and *R. flavipes* (eastern subterranean termite). Roaches were reared from an insectary; fire ants and termites were collected from natural populations. The following concentrations were used against German and American roaches: 35ppm, 75ppm, 125ppm, 250ppm, and 500ppm. Direct spray tests were conducted against fire ants and termites at the following concentrations: 35ppm, 75ppm, 125ppm, and 250ppm.

Replicates for direct spray tests were as follows:

- German roaches (adult male): 10 insects / replicate; 4 replicates per concentration (including untreated control)
- American roaches (adult male): 4 insects / replicate; 4 replicates per concentration (including untreated control)
- Fire ants: 10 insects / replicate; 4 replicates per concentration (including untreated control)
- Termites: 10 insects / replicate; 4 replicates per concentration (including untreated control)

Residual spray applications were made to vinyl floor tiles, ceramic tiles, and painted wood. Test insects were exposed to those treated surfaces for 15 minutes. The study did not clarify how much time between when the applications were conducted and when the insects were first exposed. The study also did not clarify if or how insects were transferred to clean arenas for observation after their 15-minute exposure to the test product. German and American cockroaches were tested on the following surfaces: vinyl floor tiles at concentrations of 500ppm, 1000ppm, and 2000ppm, and ceramic tiles and painted wood at concentrations of 35ppm, 75ppm, 125ppm, 250ppm, and 500ppm. Fire ants and termites were tested on plastic petri dishes at concentrations of 35ppm, 75ppm, 125ppm, and 250ppm.

Reviewer Note: Concentrations for direct sprays and residual sprays were conducted in ppm and yielded the following application rates: 35ppm – 1.5 mg ai/sq yd; 75ppm – 3.2 mg ai/sq yd; 125ppm – 5.4 mg ai/sq yd; 250ppm – 10.8 mg ai/sq yd; 500ppm – 21.6 mg ai/sq yd; 1000ppm – 43.2 mg ai/sq yd; 2000ppm – 86.4 mg ai/sq yd.

Replicates for residual sprays were as follows:

- German roaches: 10 insects / replicate; 4 replicates per concentration per surface (including untreated control)
- American roaches: 4 insects / replicate; 4 replicates per concentration per surface (including untreated control)
- Fire ants: 10 insects / replicate; 4 replicates per concentration (including untreated control)
- Termites: 10 insects / replicate; 4 replicates per concentration (including untreated control)

(3) Results:

Blattella germanica (German cockroach)

Direct application of Mustang 1.5 EW affected the treated cockroaches within 15 minutes of application and produced a minimum of 98% mortality at all test rates within 30 minutes. Surface applications of Mustang 1.5 EW at rates ranging from 500 to 2000 ppm on vinyl floor tiles caused 100% mortality within 15 minutes of exposure of the cockroaches to the treated surface. The exposure of adult male *B. germanica* to vinyl or ceramic floor tiles that had been treated with Mustang 1.5 EW resulted in 100% mortality 15 minutes after exposure. However, applications to painted wood panels required 24 hours and 500 ppm Mustang 1.5 EW to provide 100% mortality.

*Periplaneta americana (*American Roach*)*
The direct applications of Mustang 1.5 EW to American cockroaches required more time to produce visible symptoms of exposure. At the highest rate tested, 500 ppm, Mustang 1.5 EW demonstrated 100% mortality 45 minutes after exposure, while two lower rates, 250 and 125 ppm, achieved the same level of mortality at 28 and 24 hours, respectively.

Solenopsis invicta (Red Imported Fire Ant)
Fire ants died within 15 minutes after direct applications to zeta-cypermethin and from 15-min exposures to residues on a plastic surfaces. Results from all concentrations (35 ppm - 250 ppm) yielded 100% mortality.

Reticulitermes flavipes (Eastern subterranean termite)
Direct applications of Mustang 1.5 EW at 35 to 250 ppm resulted in 100% mortality 15 minutes after exposure (Table 17). Exposures to plastic surfaces took 30 minutes to reach the same 100% mortality at all tested rates.

(4) Conclusion: The **MRID 45773901** is **partially acceptable.** Results support kills claims against fire ants for direct spray application but not for residual applications. Reviewer notes the test product (Mustang 1.5 EW) was formulated with a concentration of 17.1% zeta-cypermethrin compared with the 9.15% in the subject product 279-OAUR. The proposed rate of 0.779 mg ai/sq yd on the subject product's DFU exceeds the lowest tested application rates of 1.5 mg ai/sq yd (0.1666 mg/sq ft) where efficacy was greater than 90% against fire ants.

For residual applications, the study methods did not clarify when insects were exposed to treated plastic surfaces after spray was deposited. After ants were placed in the treated arenas, the methods did not clarify whether they were transferred to a clean container after the stated 15 minutes of exposure, therefore the Reviewer has no way to verify length of exposure. Treated plastic surfaces used in the study are dissimilar from the intended turf/landscape uses and do not reflect a realistic scenario for the subject product. The surface qualities of plastic may overestimate efficacy.

Reviewer notes the subject product 279-OUAR is not labeled for cockroaches or termites. Reviewer also notes that replication was low with only four American roaches tested per replicate. Study replication should be increased or justified with a power vs. sample size analysis. Additionally, no justification was provided for using only adult males for efficacy tests against American and German roaches.

MRID 47385708: Efficacy of F6570 EW and F6578 EW for control of variety of pests.

(1) non-GLP

(2) Methods: Not applicable. MRID only includes data for Argentine ants *Linepithema humile* and a summary table citing other studies (MRIDs) conducted against cockroaches, fire ants, and termites.

Results: Not applicable.

(4) Conclusion: The **MRID 47385708** is **extraneous** because it only provides data for Argentine ants. It does not support label claims against roaches, fire ants, or termites. Summary tables of MRIDs within an MRID do not substitute for the product-specific Data Matrix.

MRID 47385709: Fire ant mound control using F6570 EW Formulation

(1) non-GLP

(2) Methods: Efficacy of test product F6570 EW (0.35% zeta-cypermethrin) was evaluated to support claims for subject product 279-OAUR against fire ants. Product was applied as an individual mound drench to 11 fire ant mounds (1 mound = 1 replicate). One gallon of water mixed with 0.8 fl oz of product (0.084 g ai) were applied directly to mounds and approximately 2 ft around. Mounds were assessed at 1, 5, 15, 60 mins, then again at 24h by inserting a dowel rod into the mound and assessing fire ant activity for 15 seconds. Sixteen mounds were designated as untreated controls.

The stated application rate per mound was 0.085 g ai/mound for the tested product. By comparison, the application rate for the subject product 279-OAUR is 1.55 g ai/mound.

Percent mound control was calculated by comparing pre-treatment counts for each mound as well as comparing average activity for the control mounds.

Results: Results showed 95% mortality against fire ants by 5 min post treatment. Control mortality remained <10%.

(4) Conclusion: The **MRID 47385709** is s**upplemental.** Ten (10) mounds are not a sufficient sample size for data analysis. The Agency recommends sample sizes should be justified in the submitted study (e.g., based on a power analysis) and to be evaluated on a case-by-case basis. Depending on the results of power vs. sample size analysis, a minimum of four replicate plots should be delegated per treatment with 10 active mounds within each plot. All plots should be as similar as possible with respect to mound density and environmental conditions. Experimental design should be balanced with an equal number of treated and negative control plots per site.

This label claims fire ant control based upon mound drenches. Treated mounds in the supporting studies were monitored up to 24h; no longer-term control data were generated and the mounds were not monitored to support control claims. Also, none of the fire ant studies had sufficient replication of mounds or workers.

MRID 47399101: Field Residual of F6570 EW and F6578 EW

(1) non-GLP

(2) Methods: Not applicable. MRID includes data for Argentine ants *Linepithema humile* and a summary table citing other studies (MRIDs) conducted against additional pests.

Results: Not applicable.

(4) Conclusion: The **MRID 47399101** is **extraneous** because it only provides data for Argentine ants. It does not support label claims against fire ants.

IV. EXECUTIVE DATA SUMMARY:

The **MRID 45773901** is **partially acceptable.** Results support kills claims against fire ants for direct spray application but not for residual applications. For residual applications, Reviewer could not verify ant exposure throughout the study. Test conditions were not realistic for the proposed product uses in turf environments.

The **MRID 47385708** is **extraneous** because it only provides data for Argentine ants. It does not support label claims against fire ants. Summary tables of MRIDs within an MRID do not substitute for the product-specific Data Matrix.

The MRID **47385709** is **supplemental**. Results suggest that low label rates of zeta-cypermethrin may kill fire ants when applied as a mound drench. However, the sample size consisted of 10 mounds, and therefore does not support a claim due to insufficient replication.

The **MRID 47399101** is **extraneous** because it only provides data for Argentine ants. It does not support label claims against fire ants.

V. LABEL RECOMMENDATIONS:

(1) List changes to the directions for use:

- Remove "Ant spp." from the list of insects (pg 4) or qualify that Harvester, Pharoah, Fire, and Carpenter ants are excluded from the claim.
- Remove fire ant application directions against mounds (pg 6 of label).
- Indicate that the product will work as a direct application against fire ants.
- Remove following text (pg 6 of label): "*Control will be optimized by combining broadcast applications [of longer residual products such as Talstar Xtra Granular Insecticide Featuring Verge Granule technology or Triple Crown Golf [T&O] Insecticide] that will control foraging workers and newly mated fly-in queens with mound drenches that will control existing colonies."*

(2) The following new marketing claims are acceptable: Kills fire ants when directly sprayed

(3) The following new marketing claims are unacceptable: Control claims against fire ants, fire ant colonies /mounds, and newly mated queens.

(4) The following MRIDs should be removed from the data matrix, as they are classified as "unacceptable" to support the product: 47385708; 47399101

(5) Note to the PM: This label claims fire ant control based upon mound drenches. Treated mounds in the supporting studies were monitored up to 24h; no longer-term control data were generated and the mounds were not monitored to support control claims. Also, none of the fire ant studies had sufficient replication of mounds or workers.